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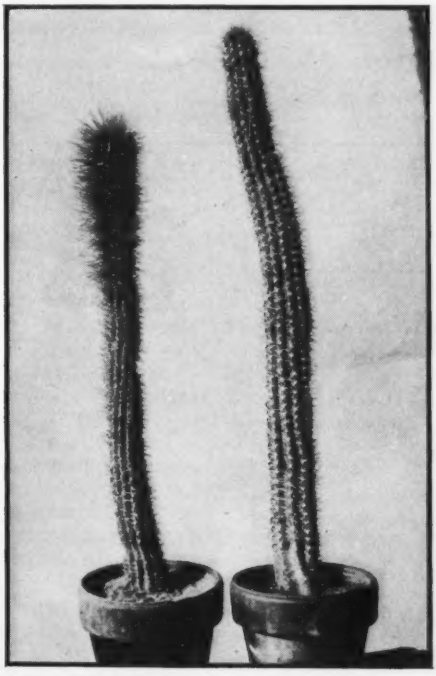

Lophocereus gatesii, sp. nov.

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A New Species of Lophocereus

By MARCUS E. JONES

Lophocereus gatesii, sp. nov.

Plantas 2-3 m. alta, liberiter divaricata, basi facienti, plantas 3 m. latas; ramis recurvatis ad bases; igiter rectis, parce olivaceo-viridibus, 9 cm. latis; lignoso cordi 2-2½ cm. lato; costis 10-15, 1 cm. altis, acriter angulatis; areolis 5-6 mm. latis, ovalibus, 1 cm. distantibus; spinis radialibus 8-10, acicularibus, patentibus, cinereis; spinis centralibus 3-5, subulatis, 1-1½ cm. longis, cinereis; florentibus areolis lanatis, compactis, rotundis; spinis 15-20, cinereis, 4-6 cm. longis; flore 3 cm. longa, 3 cm. lata; exterioribus segmentis 1-1½ cm. longis, angustis, acuminatis, fuscescentibus cum corollinis marginibus, interioribus segmentis 21-22, angustis, acuminatis, recurvatis, nigro-corallinis; stylum coccineum est; stigmatis lobis albis; filamentis numerosis; antheris albis; fructu ignoto. Typum depositum est in Herbario Dudleyi, Stanford University, California.

Plants 2-3 meters high, branching freely from base, forming plants 3 meters broad; stems outcurving at base, then erect, pale olive green, 9 cm. in dia.; cylindrical woody core 2-2½ cm. in dia.; ribs 10-15, 1 cm. high, sharply angled; areoles 5-6 mm. in dia., oval, 1 cm. apart; radial spines 8-10, acicular, spreading, gray; central spines 3-5, subulate, 1-1½ cm. long, gray; areoles of flowering portion, lanate, closely set, circular; spines 15-20, gray, 4-6 cm. long; flower 3 cm. long, 3 cm. in width; outer perianth segments 1½ cm. long, narrow, acuminate, brownish with coral edges; inner segments 21-22, narrow, acuminate, recurved, burnt coral; style pink; stigma lobes white; filaments numerous; anthers white; fruit not observed.

Type collected at Aguja Ranch, Baja California, (Long. 111° 10′ W., Lat. 24° 10′ N.), March 21, 1933. The distribution is apparently confined to the silty bottoms of a few canyons opening onto the sea coast near the type locality.

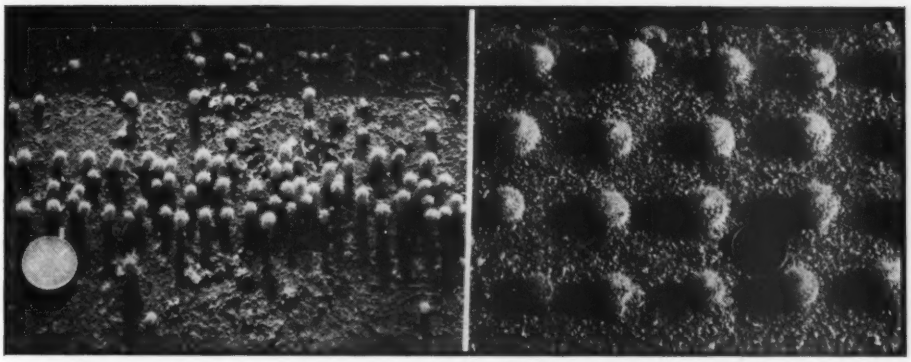
This species differs from all other Lophocereus in the great number of ribs which are numerous enough to make the branches appear cylindrical instead of angular. Plants have the general character of the Lemaireocereus group, but bear the short flowers of the Lophocereus group and tend to break down the general character of the Lophocereus, though the young parts show a tendency to the fluted character of *L. schottii* and the long weak spines of the flowering portion of the branches are typical of the Lophocereus group.

The species is named after the discoverer, Howard E. Gates, of Anaheim, California, who is an ardent lover of the Cacti and has made many exploring trips throughout Lower California.

PRICE LISTS RECEIVED

Rio Grande Valley Cactus Garden, Edinburg, Texas. Retail plant list of native and exotic cacti and other succulents. (Free.)

Robert Blossfeld, Potsdam, Germany. Trade Catalogue for Seeds of Cacti and Other Succulents. 58 pages, 63 excellent illustrations.



One-year-old seedlings of *Neomammillaria habniana* (rather slow growing species) raised without controlled heat. RIGHT: 10-months-old seedlings of *N. klissingiana* (also slow growing species) raised with controlled heat. Comparison of actual size can be seen by the pennies among the plants.

Raising Cacti from Seed

By WRIGHT M. PIERCE

Photos by Author

The raising of cacti from seed is a fascinating experience but, unless the right conditions are provided, it is most difficult and discouraging; for without controlled heat, light, and moisture the results are apt to be very poor. It is true that seeds can be germinated after a fashion and grown by a window in an ordinary room, but under these conditions the mortality is usually great. Also, compare these plants with specimens grown under controlled conditions and note the difference (see photos). For instance, *Echinocactus grusonii,* the golden barrel, raised in the hothouse under ideal conditions, should be an inch or more across at the end of a year, while one grown under uncontrolled conditions would possibly be a quarter that size, and more important still, the former would be a stronger and more beautiful plant.

Nevertheless, if the seeds have been harvested before they are ripe, or perhaps if they are too old, even under the best of conditions the germination will be poor, or perhaps no germination at all, and if any plants do come up they are apt to be weaklings and no amount of tender care will bring them along to really fine specimens. Poor seed can be blamed for failures more than anything else by the professional and also old seed is much to be preferred to unripe.

As to the time of year for planting cacti seeds: with hothouse culture, plantings that have been made nearly every month of the year have been successful. Without these favorable conditions I would suggest March or April as the best time so that the seedlings would have a fair start to help them through their first winter.

Now as to the methods of planting and raising let me offer a few suggestions. Use a mixture composed of sixty per cent good loose soil, add twenty-five per cent clean sand and the remaining fifteen per cent well rotted leaf mold; sift this mixture through an eighth-inch screen and thoroughly mix. For cacti I do not like oak leaf mold which some of our authorities recommend. It is not a bad idea to add some ground charcoal and perhaps a little hydrated lime or pulverized old mortar, as both of these tend to keep the soil sweet. I prefer ordinary redwood flats rather than pottery pans for the seed beds, since these boxes do not dry out as rapidly and they also hold a more even temperature. Now as to the actual planting of the seed, put the above soil mixture into the container and tamp down gently until the flat is filled to within one inch of the top; on this scatter the seeds, being careful that each is well spaced from its neighbor. Keep each species separate by dividing the flat into spaces with little strips of glass or wood. Be sure to mark each with its correct name (at least with the name under which the seed came to you; more will be said about this later.) Or, if you prefer, mark with a number, which should be kept in a per-

manent record book. After the seeds are sown, firm them into the soil and cover with a thin layer of fine sand; now you may add a light covering of small pebbles, ground charcoal, or redwood sawdust. Any one of these coverings tends to hold the moisture and so helps to guard against violent and sudden changes of temperature, which is tremendously important, and this blanket also holds the seeds in place when watering.

Some very successful propagators of cacti seed prefer to water from below by placing the seed pan or flat into water and letting the moisture gradually soak up from below; however, many who are equally successful, water from above with a fine gentle spray. The seeds and small seedlings must be kept moist, but they should not be kept soaked. A good rule to follow is to water a little each time but moisten them often. When the weather becomes cloudy and rainy or cold, less moisture is desirable; however, with controlled temperature in a hothouse one need not worry so much about the weather outside. My rule is to never let the heat get below sixty degrees and I am better satisfied with a temperature of from seventy to eighty; more does not seem to do damage but one should guard against sudden changes which causes damping off; should this start, at once treat with Semesan and you may be able to arrest the trouble. After the plants are larger, say a year old, except with the most tender varieties, they do not need so much heat, especially if they are watered less during the fall and winter. With most species, especially if dormant and kept dry, I find that they will stand considerable cold, but if they are growing, many comparatively hardy ones will wilt with the cold. This is the reason that an early frost in the fall will often damage many usually hardy plants in our outdoor gardens.

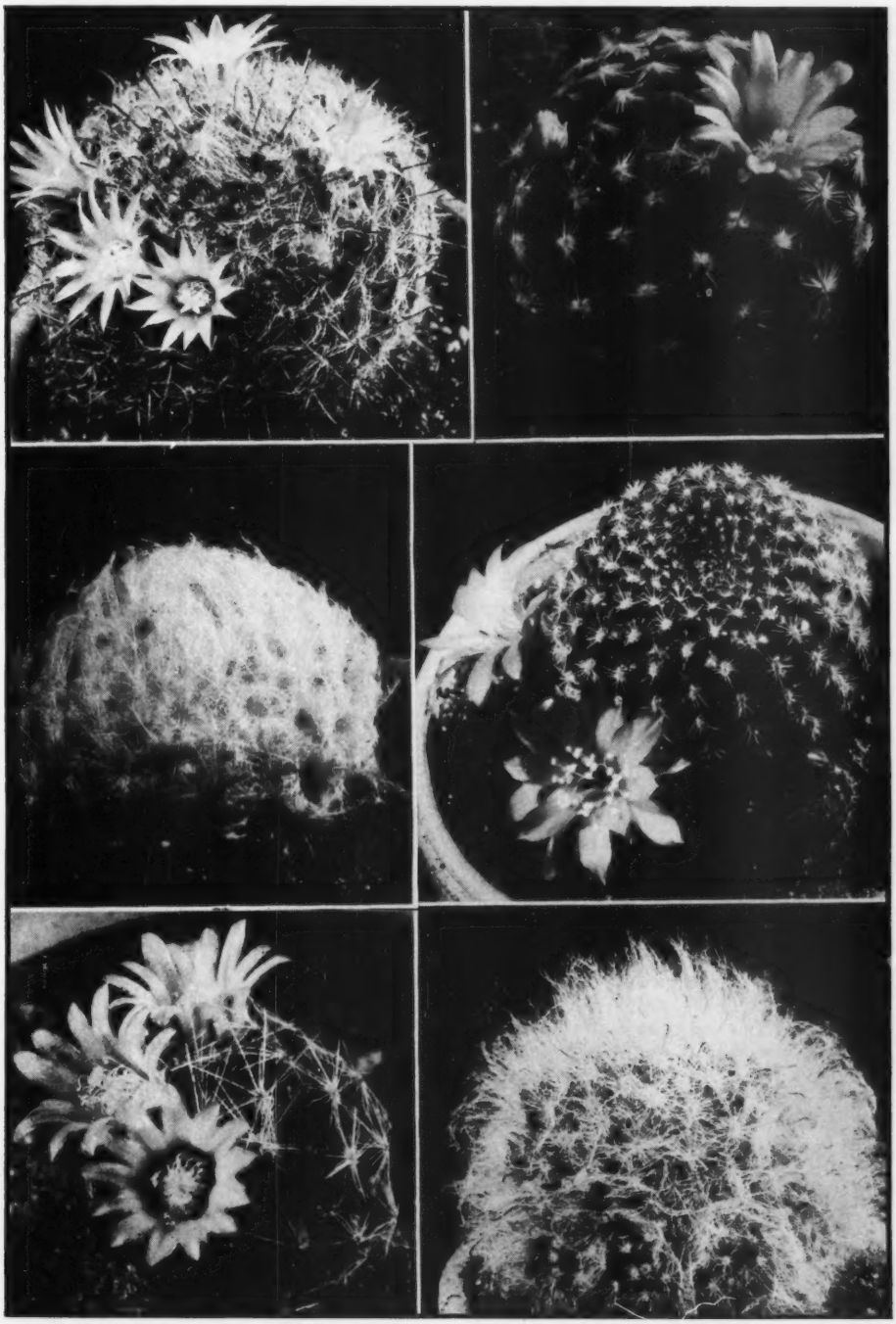
After the seedlings are of fair size or begin to crowd each other they should be transplanted into regular flats, using about the same mixture as before, though it may be made a little richer in leaf mold and it does not need to be sifted through such a fine meshed screen. This screening of the mixture is quite important for it breaks up the soil and makes it more friable, and these young desert plants seem to revel in a loose, fairly rich mixture. It appears to be a good plan to give the plants considerable room and not crowd them in the flats and after transplanting, it is always desirable to keep them warm for a few days and not to water too heavily during that time. As to the exact age at which to prick off from the seed bed it is impossible to state, since different species have different rates of growth; some Cerei could be moved in a month after germinating, while some of the Neomammillarias and Echinocacti do well in the seed bed for many months.

In regard to baking the seed soil, some recommend this as a precaution against destructive insects and such, but to do so kills valuable growing bacteria. After much experimenting I can not favor this procedure.

Seedling cacti have many enemies, and this is not surprising since they are such tiny, delicate things, mostly all water. One roving mouse in a seed house, should it develop a liking for cacti, would be like a pestilence. Sow bugs often cause trouble, and crickets are especially bad, as one of these insects can cause a lot of havoc in a night, as this culprit seems to delight in going from plant to plant just biting out the top or growing center of each. I have seen one seed bed of hundreds of plants nearly wiped out in a night or two by this pest. I prefer to feed both this rascal and the sow bugs Snarol, after which neither seem to have any desire for a cacti banquet. Cactus scale, *Eriococcus coccineus,* is especially destructive to little seedlings, stopping their growth and eventually killing them. Watch carefully for this and do not let it get a start. Though I have always loved birds I do not want any of even my most favored ones in my hothouses. They either tramp on the plants in trying to escape or scratch them out in their explorations or they pull them up through mere cussedness or they may perhaps even sample a few dozen. They seem to always pick out the most rare kinds; perhaps these have the best flavor!

Besides all these difficulties and the cold or perhaps too much moisture or even too much dryness, we cacti raisers have other difficulties to try our souls. For instance, I have planted some so-called rare South American Cerei seed and reaped a common Mexican Echinocactus for all my tender care and trouble. In one lot of supposedly Neomammillaria seed of one species, the resulting plants looked like fifty-seven varieties of Neomammillarias, Echinocacti and Cerei—a wonderful display in itself, but not to me, for I had just about mortgaged the family home to acquire this supposedly rare seed. Then I receive a lot of seed that is poor and will not germinate—even one pathetic little plant. Certain of the choicest varieties seem next to impossible; this is probably the reason for their rarity.

I realize that my technique in raising cacti from seed is very likely far from perfect, but



Seedlings raised by Author. LEFT TO RIGHT: (Top) *Neomammillaria longicoma, N. schiedeana;* (Center) *N. plumosa, Rebutia miniscula;* (Bottom) *Neomammillaria viereckii, Neomammillaria bocasana.*

when I note some of the Neomammillarias in the flats not yet a year old and nearly an inch across I feel that I am making progress. When a friend made the remark that perhaps these plants had been grown too fast and were soft and tender, I wondered, so planted them outdoors as an experiment; these have gone through rain and cold with so little difficulty that I am satisfied now that I am on the right track. The largest and fastest growing plants in a flat, for by no means do all the plants of the same species grow at the same rate, seem to be the most hardy, and nearly always these are the first to flower. Some of my *Malacocarpus ottonis* at two years of age have flowered, and what a joy and thrill—with their large, rich, yellow flowers that nearly covered the plant itself; these have even set seed which have germinted one hundred per cent into nice healthy seedlings; no race suicide here! At two years of age a flat of *Neomammillaria decipiens* started blossoming and have flowered continuously for one entire year. At the same age *Rebutia miniscula,* every plant in the flat, has a ring of bright red flowers springing from around the base. Often seedlings, even up to three years of age, do not resemble the mature plants; many of the Neomammillarias which have naked axils as seedlings, develop wool and hairs when they grow older, though several of the rare South American *Oreocereus* and *Cephalocereus senilis,* as well as the other species, show their characteristics even when very young. Study the first spines of a *Neomammillaria plumosa* under a microscope and you may have a pleasant surprise, for these first minute spines show feathery (plumose).

Even with all the difficulties and disappointments, I find this game of raising cacti from seed exceedingly fascinating from the time the seeds germinate and push up into tiny little balls with their green, red, or brown transparent bodies, until they grow into their own shapes and forms and coverings to finally burst forth into blossoms of wonderfully delicate or startling colors. I am sure that all these surprises and thrills as they grow and change and perhaps the even more real excitement when they first blossom, well repay me for all the care and labor that I have expended in raising them. These perfect specimens, unmarred, seem so much more desirable than desert collected plants, which are not used to our climate and do not seem to enjoy being transplanted as do our hand-raised seedlings. Furthermore, as most of you know, I am in favor of preserving our deserts and therefore my motto is, and I can not say this too emphatically: "Conserve our deserts by the use of seedlings rather than plants torn from their native desert haunts."

SIXTH ANNUAL SHOW

The time for the Sixth Annual Show is near, May 11, 12 and 13, 1934 having been selected as the dates. The Edward Rust Nursery, Euclid and Glenarm Streets, Pasadena, California is the place.

Your Show Committee is working on the details at their regularly weekly meetings, and are pleased to report very gratifying progress.

Present indications point to the best show ever. The enthusiasm for the coming exhibition has manifested itself, so far, in a number of requests for double the former space.

We are planning to cover the outside area with a cloth house for the coming show. This will make that space more attractive for the exhibitor as well as for our guests.

The Amateur division is receiving a lot of attention in committee meetings. We hope to make the prizes more attractive this year, so clean up your pets and decide how to stage them to the best advantage.

A number of new importations have been promised for exhibition. Among the list are plants from South Africa, South America and also some new species from Mexico.

Garden hybrids will be interesting as many growers are working with a camel's hair brush among their flowers in the endeavor to improve, or at least produce something different that will be worth while.

Seedling cacti promise to make a big showing again. You can expect to see a number of new species; also, it will be interesting to note the new growth on those shown before, which is something even for such slow growing plants as certain cacti.

Remember, an exhibition hall is the best place to compare notes with others who are interested in the growing of rare and interesting denizens of old Mother Earth's arid spots. Come and find out how some one else treats his plants. Lots of cultural information can be had for the asking: and don't forget all the nice arguments possible as to the correct names of cacti and other succulents.

Come to the show and get as many of your friends as possible to do the same.

Entry blanks, rules, and prize schedules will be mailed to all members of the Society. Hope you all win first prizes!

WM. J. SURGANTY, *Show Mgr.*

Thelocactus ysabelae, A New Species

By KATHE G. SCHLANGE

In the spring of 1931 the Garden of Mrs. Ysabel Wright received from A. F. Moeller of San Pedro, Coahuila, Mexico, specimens of a *Thelocactus* which were different from any known species of that genus. The plants took kindly to cultivation and have flowered profusely ever since, further inspection of the flowers making it definitely sure that the species is new. Inquiries made in the meanwhile at the source of the importation established the fact that the plants had been gathered, it would seem as an occasional bit of collecting, by a native who obtained them at a small ranch, El Vergel, located on the Railroad from San Luis Potosi to Tampico.

The form undoubtedly is very scarce for no other specimens were secured and I am not aware that other ones have been collected in localities different from the one indicated. In view of the restricted habitat that the species enjoys and of the small number of plants ever brought to notice, it is remarkable that one plant at least differs from the type in a way that suggests the advisability of presenting a variety together with the species.

The species which in honor of Mrs. Ysabel Wright I will call *Thelocactus ysabelae* may be described as follows:

THELOCACTUS YSABELAE sp. nov.

Depressa globosa ca. 6 cm. alta, 7-9 cm. lata, apice lanosa. Costis 13-15; tuberculis brevibus, crassis, 5 mm. longis; axillis nudis; areolis oblongis. Spinis pectinatis, intertextis; radialibus 16-20, 2-7 mm. longis, albis apice brunneis; spina centrali solitaria in areola summa excrescente interdum in ordine ipso radialium, alba apice griseo v. caeruleo-nigrescente. Flore campanulato 1 cm. longo, ¾ cm. lato; perianthii lobis internis 12, eburneis; externis 12, lineari-lanceolatis, ¾ cm. longis; viridescentibus linea brunnea ad medium percursis. Ovario 1/3 cm. longo, flavescente. Filamentis plurimis; antheris luteis stylo 1.5 mm. longo.

var. *brevispina*

A specie differt tuberculis brevioribus, minoribus; spinis minus intertextis atque brevioribus.

Plant body medium green, depressed, globose, about 6 cm. high, 7-9 cm. in diameter; apex depressed, woolly, covered over by the short, slightly curved, bluish-black central spines of the upper areoles. Ribs 13-15. Tubercules short, stout, 5 mm. long, appressed, 4-5 angled, 7 mm. in diameter at base, subterete at the tip. Axils naked. Areoles oblong, 3-4 mm. long, 1.5 to 2 mm. wide, when young very woolly.

Thelocactus ysabelae sp. nov.

Tubercles slightly grooved at the upper side. Spines pectinate, interlocking, appressed, translucent white. Radial spines 16 to 20, shorter above, longer below, 2 to 7 mm. long, slightly bulbous at the base, when young yellowish at the base, the rest white with yellowish-brown tips. Central spines solitary, located at the upper corner of areole, sometimes growing directly on line with the radials, slightly flattened and incurved, 7 to 9 mm. long, chalky white with gray to bluish black tip. Flower campanulate 1 cm. long, ¾ cm. broad at the mouth. Inner perianth segments 12, ivory-white, greenish at the base; outer segments 12, linear-lanceolate, ¾ cm. long, pale green with a dark brown stripe along the midrib and brown tip. Ovary 1/3 cm. long, yellowish. Style 1.5 mm long. Filaments numerous with bright orange anthers. Flowers during April-May and September-October. The flowers last for 3-4 days closing in the afternoon. Fruits not seen.

var. *brevispina*

Like the species but: tubercles somewhat shorter and not so stout; spines not interlocking as much as in the species; spines shorter.

I am indebted for assistance in arranging the Latin diagnosis notes to Dr. L. Croizat of New York.

Proposed Changes in the Constitution and By-Laws of the Cactus and Succulent Society of America

The Executive Board submits these for your approval, feeling that the changes herein outlined are imperative for the best organization of the Society. One change to be made is a movement to tie in local organizations so that we can all heighten our advantages. The other is to provide for more stability in the government of the Society because at the present time new members on the Board have to feel their way for some time and more continuity will help to keep the Society running in the best of order.

CHANGES IN THE CONSTITUTION

Article II, Section 1—Shall be changed to read: "There shall be five classes of Membership: Active, *Affiliate, Associate, Life* and Honorary."

Sec. 2—"nine or more" shall be changed to read: "twelve or more."

Section 3—Shall be changed to read: "The Executive Committee of this Society shall consist of the President, all Past Presidents, who have continued to be Members of the Society, the First Vice-President, the Recording Secretary, the Corresponding Secretary, the Treasurer, the Librarian, the Editor, the Subscription Editor and four others elected by the Society."

CHANGES IN THE BY-LAWS

Article I, Section 3—Insert "Recording" before the *word "Secretary" wherever the latter word occurs in* this section. Change the sentence referring to the decease of the Secretary to read: "In the event of the resignation or decease of any Member of the Executive Committee, the Executive Committee shall appoint a Member of the Society to fill the vacancy until the next election, at which time the vacancy shall *be filled by a vote of the Members of the Society."*

Insert the following new Section after Section 3:

Section 3A—"Corresponding Secretary. The Corresponding Secretary shall handle correspondence with Affiliated Societies, foster the formation of Affiliated Societies and operate a service bureau for their benefit. He shall keep the Executive Committee informed *of the activities of all Affiliated Societies. The Secretary of any Affiliated Society* shall be privileged to communicate to the Corresponding Secretary any matter which his Affiliated Society wished to have brought before the Executive Committee, and it shall then be the duty of the Corresponding Secretary to bring such matters before the Executive Committee at *its next meeting and secure definite action thereon by the Executive Committee."*

Section 5—"The Librarian shall hold office until removal or upon resignation" shall be changed to read: "The Librarian shall be appointed each year by the Executive Committee at its first Meeting of the year. The Librarian may be removed from office by *the Executive Committee at any time." Omit the last* four words of the section: "until the next election."

Insert this new Section:

Section 5A—"The Editor shall be appointed and may be removed by the Executive Committee in the same manner as the Librarian."

Section 6—Delete the sentence: "It shall have *the Society's accounts audited, etc.," and replace with:* "It shall have the accounts of the Treasurer and of any other Officer who has received funds belonging to the Society audited annually by a Committee of three Members chosen by the Society from the floor at the December Meeting. It shall fill any vacant appointive office." (Note: The filling of elective offices is provided for elsewhere.) Change the sentence: "Immediately after this meeting, etc.," to read: "Immediately after this Meeting, the Recording Secretary shall prepare ballots containing the names of the candidates selected by the Nominating Committee, and also the names of all those nominated from the floor, together with a blank space for each office in which the Member voting may write in the name of any Member instead of the one printed on the ballot."

Article III. Insert as new Section: Section 4—"Affiliated Members shall have all the rights and privileges of Active Members, the name "Affiliate" merely indicating that they are Members of an Affiliate Society in addition to being Members of the Cactus and Succulent Society of America."

Article II, Sec. 2—Delete and replace with: "At *each election two Members shall be elected* to serve as Members of the Executive Committee for a term of two years. At the December, 1934, election, four such Members of the Executive Committee shall be elected, two of whom shall be designated to serve terms of one year in order to put into effect a system of overlapping terms. The terms of all other elective *offices shall be one year."*

Article VIII. Delete the entire present text and substitute: "AFFILIATED SOCIETIES—Any Cactus and Succulent Society or other horticultural Society whose objects correspond with the objects of the Cactus and Succulent Society of America may affiliate *with the Cactus and Succulent Society of America* upon approval of its Application for Affiliation and of its Constitution and By-Laws by the Executive Committee of the Cactus and Succulent Society of America, provided such other Society numbers among its members at least five who are also members in good standing of the Cactus and Succulent Society *of America. These members shall be designated Affiliate* Members upon the affiliation of such Society. An Affiliated Society may contain as many other members, not members of the Cactus and Succulent Society of America, as its own By-Laws may provide for.

"The dues and subscription for Affiliate Members *shall be the same as dues for Active Members, but* one-fourth of the amount of dues and subscription received from Affiliated Members for the renewal of Membership and Subscription and one-third of the amount so received from Affiliate Members who are joining the Cactus and Succulent Society of America for the first time shall be remitted to the Secretary of *the corresponding Affiliated Society for use in defraying the expenses of that Society.*

"An Affiliated Society shall be completely independent of the Cactus and Succulent Society of America as regards the conduct of its own affairs.

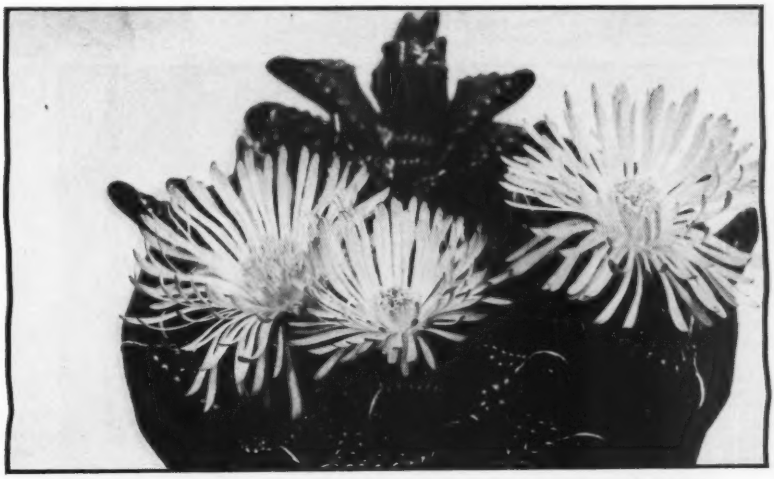
"If an Affiliated Society shall at any time cease to contain among its members at least *five Affiliate Members in good standing in the Cactus and Succu*lent Society of America it shall automatically cease to be an Affiliated Society. The affiliation of an Affiliated Society may be terminated by resignation. The affiliation of an Affiliated Society may be terminated by the Cactus and Succulent Society of America for any cause which renders it unfit for continued affiliation by a procedure corresponding to that provided in the Constitution of the Cactus and Succulent Society of America for the expulsion of a member."

The following 8 pages are reprinted from "The Cactaceae" by N. L. Britton and J. N. Rose.

Some Remarks On Mesembryanthemums

(Continued from Vol. V, No. 9, March, 1934)

By R. W. POINDEXTER



Faucaria tuberculosa Schw. Approximately natural size. Soldena Gardens.

DESIRABLE VARIETIES

It is difficult to make such a list on account of the wealth of material and the certainty that many good ones will be left out. Let us begin with the smaller plants, which every collector has room for. The smallest are the many species of *Conophytum*, some of which take a year or more to attain the size and somewhat the appearance of a green pea. *Conophytum* is considered a "cranky" genus because the growth of many species is so much slower than people anticipate and because each species needs a definite resting period; a requirement which must be studied and met to ensure success. Yet every collection which boasts of completeness should have one or more of these, because they are the smallest of all succulents. You are referred to N. E. Brown's article on page 425 of Vol. II of this Journal, which illustrates a number of species, as well as to "Mesembryanthema" which deals most extensively with Conophytums and has colored illustrations of them.

I would give first place to *Lithops*. These little living pebbles are among the most satisfactory Mesems for those who are forced by climate to use a greenhouse. Lithops are among the most striking "mimicry plants" in existence. A friend of mine was able to add to his collection by arranging seven of them among matched natural pebbles and betting visitors they couldn't find all of them. He bought new plants with his winnings. *Lithops* are such small plants, averaging an inch and a half across, before they begin to cluster, that no one can say he hasn't room for them. There are 40 or 50 species available from dealers, and a complete set of them could be grown in a space a foot square. They are as handy to collect as postage stamps, and grow so slowly that once "mounted" they are nearly as permanent. Besides this they are friendly, and quite willing to live under greenhouse conditions. It is preferable to plant a number of them together in rather shallow wooden boxes, which may be appropriately painted, or in pottery pans, rather than to put each *Lithops* in a small pot by itself. They not only look better but do better. Small pots dry out excessively on the sides, making frequent waterings necessary, and rapid alternations between being too wet and too dry are hard on the root system. The access of air thru the sides of a porous pot is not the advantage so often believed. It is perfectly true that some air in the soil is absolutely required, yet a very

little is sufficient, and a larger amount cannot be utilized. Owing to the tapering form of standard flower pots, the roots will receive more than their normal quota thru the top surface of the soil, even tho the sides be glazed or otherwise rendered air tight. On the other hand, single plants in oversize pots do not thrive because pot soil goes dead unless penetrated by roots. The planting of several plants together in one tray or pan avoids both difficulties.

Lithops Comptonii L. Bol. Natural size. Soldena Gardens.

The top soil for any potted succulent should be something coarse, such as gravel, crushed rock or pebbles. Crushed brick and crushed charcoal are excellent from the plant's point of view, but inartistic to most tastes. Crushed charcoal is valuable as a top dressing since it prevents the growth of slimes and algae, and is also very useful to furnish drainage at the bottom of the pot as well as a constituent of potting soil.

The well known *Verrucaria Schwantesii* and *Titanopsis calcarea* are excellent greenhouse subjects, and should be in every collection. These two species are characterized by remarkable opaque white warts on the tips of the leaves which cause them to closely resemble the calcareous tufa in which they naturally occur. *T. calcarea* is considered one of the best examples of mimicry. Another striking mimicry group consists of *Pleiospilos* and *Punctillaria,* the latter genus being included under *Pleiospilos* by some authorities. This group can be successfully handled in the greenhouse with a little care, tho distinctly preferring to be out of doors and blooming much better there. *P. simulans, P. Bolusii* (described and illustrated on page 363, Vol. II, this Journal, by James West) and *P. Nelii* (page 395, Vol. 4) are among the most striking and valuable of all Mesems. *The* most striking and valuable in the opinion of many collectors.

Nananthus is a genus of several species, any one of which is worth acquiring. They are smallish plants of tufted habit resulting from very short stems which radiate from the top of a carrot-like central root, as was mentioned under methods of propagation. *N. vittatus, N. aloides* and *N. rubrolineatus* are to be recommended. The last named has the best flowers. Similar to these in habit but different in flower are *Rabiea albipuncta* and *R. albinota,* both excellent species. These plants and a number of others which grow with large central tap roots should be planted in pots sufficiently deep to accomodate them.

If you want to test your skill, try raising *Fenestrarias* in pots. There are two species available; *F. rhopalophylla* and *F. aurantiaca.* The former is illustrated on page 459, Vol. II of this Journal and rejoices in the name of "baby toes." *F. rhopalophylla* is the most sensitive to overwatering of any succulent I have worked with in pots. A single heavy watering will kill like a dose of kerosene or arsenic. Yet they must have water to keep alive. Apparently the solution is to water the pots from underneath, giving measured doses, insufficient for the water to seep very far up thru the soil and

thus moistening only the tips of the roots.* Out of doors they will thrive even tho rained on, provided they have good drainage and a sufficiently coarse top soil. They are quite a puzzle. The name *Fenestraria* is given the genus because of the windows in the ends of the leaves. In their native habitat they grow buried in sand except for these leaf tips, and absorb all their sunlight thru the windows. In cultivation, however, I have never seen anyone succeed in growing them except above ground, and would expect to see them die promptly if covered with sand. The plants are rapid growers and can be propagated by cuttings. They flower, tho not very freely. *F. rhopalophylla* has pure white flowers, while those of *F. aurantiaca* are golden, as the name indicates.

Rimaria Heathii with its globular growths is very popular, and here is one Mesem which possibly does better indoors than out. Be careful not to over-water it. It is well illustrated by our Dean of mesembryanthemologists, James West, on page 453, Vol. V (October, 1933) both in flower and without. The former is a rare condition with this plant. In the same article, Mr. West illustrates *Dinteranthus Pole-Evansii, D. microspermus* and *Lapidaria Margaretae*. All four are extremely compact, slow growing, typical mimicry plants. *Dinteranthus puberulus* is also a very fine species. These are among the aristocrats of the Mesems and so are the *Argyroderma* species (silverskins). *A. testiculare* is illustrated at page 107, Vol. III. It is not hard to raise from seed, tho slow growing, like the other Mesems mentioned in this paragraph. It does not look like a mimicry plant until you are told that it occurs among white quartz rocks.

*The scheme outlined on p. 522 of the Feb., 1934 issue might be utilized.

Cheiridopsis is a large genus usually having erect tufts of leaves. These vary in color from gray-green to nearly white in typical species. The flowers are of many lovely shades, some delicate, some brilliant, but with yellows predominating. For the most part these are borne on long erect stems. They are afternoon bloomers. Species good for indoors are *candidissima, Vanzijlii* and especially *Caroli-Schmidtii;* also *C. peculiaris,* which is indeed peculiar for a *Cheiridopsis* in departing so widely from the typical leaf form. The species of *Cheiridopsis* are again winter growers, and a number of them are at present (January 2) in flower in my garden. This winter habit is emphasized by *C. Meyeri,* which is at present a verdant green and in bud, but will be white and withered next summer. At the dormant season, the leaves wither and form pure white sheaths which enclose and protect the new leaves which will develop the following winter. Needless to say, water must be kept from this plant while it is resting. *C. tuberculata* has very slender leaves and a lot of them, altho its seedlings start with few leaves and thick. It is not an interesting plant, but when it blooms it produces a lot of flowers all at once on exceptionally long and erect stems, so that it will delight you during that brief time. I cannot promise that it will bloom well indoors. I believe most species of *Cheiridopsis* will make satisfactory growth in a greenhouse and know that *C. Caroli-Schmidtii* will bloom well there.

By all means include *Faucaria* in your collection and the somewhat similar *Rhombophyllum rhomboideum.* These grow and bloom exceptionally well under greenhouse conditions. Faucarias in my opinion, but they are all good, *Faucaria tigrina* var. *superba* is the best of the whether in flower or not.

(Concluded in next issue)

LEFT: *Cheiridopsis peculiaris* growing out of doors in Soldena Gardens, Pasadena, California. Approx. x0.3. RIGHT: *C. verrucosa* actual size, Poindexter photo.

Bax' photograph

LEFT: Coryphantha alversonii *in flower. Flowers form a circle near the top of the plant and last for several days. They readily fertilize; and soon after they wither appears the greenish fruit that remains for months.* RIGHT: *A multiple plant of* Coryphantha alversonii *with five heads. This picture and the other photograph were taken in rocky washes south of 29 Palms, California.*

California Cacti

By E. M. BAXTER

XI. CORYPHANTHA

The name "Coryphantha" means "top-flowering," alluding to the feature of the genus of having its flowers borne at the top of plants. A feature distinguishing it from the genus *Neomammillaria* is the grooving of the tubercles on their upper side.

California is the home of three distinct species of *Coryphantha* and is not the home of one species generally ascribed to it. This last species is *Corpyhantha chlorantha* which I believe is to be found only in that district of unusual species—Arizona and Utah on the North Rim of the Grand Canyon. Most of our specimens named "Coryphantha chlorantha" are probably the real *Coryphantha deserti,* while specimens labeled with that name are *Coryphantha alversonii. Coryphantha arizonica,* our third resident species, is the rarest of the three and inhabits the territory of *Coryphantha deserti* in its eastern part.

KEY TO CALIFORNIA SPECIES OF CORYPHANTHA

Central spines 2 to 6
Radial spines about 25; plants simple, generally short conical in shape..... *C. deserti*

Radial spines fewer than 20; plants multiple, generally markedly subglobose, flowers ragged appearing because of the narrow perianth segments..... *C. arizonica*

Central spines 12 to 14; plants large, simple or multiple; distribution in middle Southern California *C. alversonii*

Bax Photograph

Coryphantha deserti *near type locality in natural habitat. This shows the general appearance of the plant and is a normal specimen in size, spination, and habitat.*

Coryphantha Deserti

Plants are simple, only once have I seen a double-headed plant in more than a hundred specimens; globose to oval shaped; seldom more than 2½ inches high and equally thick. Spines are whitish, the longer ones and the centrals with reddish-brown tips in the upper one-third of the spine. Central spines are 2 to 4 in number, ⅜ inch long, radial spines are about 25 in number of varying lengths and thickness but distinctly more slender than the centrals, and are ¼ inch long. The central spines spread out, raised about at a 20 degree angle above the horizontal position of the radials. At the apex of the plant all are massed together, forming an impenetrable thicket of spines, the massing of colored tips gives a dark color to that part of the plant, the rest of its body being obscured by the solid whiteness of the faded centrals and the radial spines.

Tubercles are cylindric, deeply grooved for the whole upper length. They are arranged regularly in approximately 17 winding rows, regularly undistinguishable in the opposite direction.

Flowers are very similar to those of *Coryphantha alversonii* in that the sepals and petals are fimbriate, and the color is pink to rose-pink. Mature fruit is green, seeds brown.

Roots are thick and succulent.

In all respects the plant closely resembles single heads of *Coryphantha Neomexicana.*

The distribution of this species is farther to the east than *Coryphantha alversonii.* Specimens reported from Barstow may or may not have come from close to that city. I have found them only east of Baker, and from there to the State border; south to The Needles and north to Inyo County. The plants grow in rocky locations on the hillsides at an elevation (of the level ground) of around 3500 feet. Formerly they were very common, but commercial collectors have nearly cleaned them out. My description above is from plants growing near Cima, a few miles from Ivanpah, this latter the type locality of the species.

This description, as well as the one that follows, prove that the species should be characterized in this way and not be united with, and given the description of, *Coryphantha Alversonii* (Coulter) Orcutt.

The feature of straw-colored flowers with purple tips I can only account for by supposing that the description was drawn from dried flowers that had not been carefully preserved. In all other features these eastern California plants follow the original description.

The following is supplied by Professor Ira Wiggins, Curator of the Dudley Herbarium at Stanford University, California, from records in their library. The references to the specific and varietal names "alversonii" should be deleted in following my premise that that species is distinct.

***Coryphantha deserti* (Engelm.) Britt. & Rose,** Cactaceae 4: 46. fig. 44, 45. 1923.

Mammillaria deserti Engelmann, Bot. Calif. 2: 449. 1880.
Cactus radiosus deserti Coulter, Contr. U. S. Nat. Herb. 3: 121. 1894.
Cactus radiosus alversonii Coulter, Contr. U. S. Nat. Herb. 3: 122. 1894.
Mammillaria alversonii Zeissold, Monatsschr. Kakteenk. 5: 70. 1894.
Mammillaria radiosa alversonii Schumann, Gesamtb. Kakteen 481. 1898.
Mammillaria radiosa deserti Schumann, Gesamtb. Kakteen 481. 1898.

First described by Engelmann but not published in the first volume of the "Botany of California." For some reason it was held up and came out in the second volume under "Additions and Corrections to Volume I." The reference is "Bot. Calif. 2: 449. 1880, and the description as follows:

"5. M. deserti, Engelm. Mss. Subglobose or oval, simple, with subcylindric deeply grooved tubercles; spines 25 to 30, straight, acicular, grayish white, the larger with reddish tips, 5 to 8 lines long; 3 or 4 of the inner spines stouter but shorter, and above these 5 or 6 intermediate ones; flowers about an inch long and wide; sepals 20 to 25 in several rows, narrowly lanceolate, aristate, fimbriate; petals about 20 nearly in a single series, narrowly lanceolate, acuminate, somewhat fimbriate at base, light straw-color turning to purplish at the tips; stigmas 5 or 6, spreading; fruit oval, green, juicy, with obliquely obovate curved brownish pitted seeds.

"At Ivanpah, (1) 30 miles northeast of San Bernardino, in one of the mountain ranges stretching into the desert, *S. B. Parish.* Heads 2 to 4 inches high, and 2 to 2½ inches thick; tubercles about half an inch long. This and *M. Arizonica* belong to the

M. vivipara group, and may eventually have to be united with it.

—Engelmann."

Coulter transferred this cactus to his genus "Cactus" and the following gives the reference and description under which the new combination appeared:

Contr. U. S. Nat. Herb. 3: 121. 1894.

"61. CACTUS RADIOSUS DESERTI (Engelm.)

Mammillaria deserti Engelm. Bot. Calif. 2: 449. (1880)

"Subglobose or oval, 5 to 10 cm. high) and simple, with deeply grooved tubercles (slender and about 12 mm. long), 25 to 30 rather long (10 to 16 mm.) grayish white radial spines (the larger with reddish tips), 3 or 4 shorter and stouter centrals with 5 or 6 intermediate ones above, small (2.5 cm. long) straw-colored flowers (becoming purplish-tipped), 5 or 6 stigmas, and obliquely obovate curved seeds.—Type, Parish 453 in Herb. Mo. Bot. Gard.

"In the mountains bordering the deserts of southeastern California (San Bernardino County) and extending to central Nevada (Reese River Valley).

"Specimens examined: CALIFORNIA (*Parish* 453 of 1880, also of 1882; *Bailey* of 1890); NEVADA, Lincoln County (*Coville & Funston* of 1891, Death Valley Expedition); also specimens cultivated in Meehan's Gard. in 1882.

"The smaller straw-colored flowers alone suggest the propriety of keeping this form specifically distinct, but even in size and color there is an occasional tendency towards the specific character. The obliquely obovate curved seeds resemble those of *C. vivaparus*. The plant densely covered with stout ashy-gray interlocking spines is easily recognized."

Coryphantha Arizonica

Plants referable here I first saw in cultivation at the Kesler Ranch, near Cima, California. The man at the house said the flowers were pink, and pointed out a mine canyon south of Cima where his specimens were collected. They were noticeable because of the few radial spines, and the darkness of all spines with the dark green body of the plant showing through readily.

At Goffs, a plant was secured with three small heads around the large one. It had been collected "near-by" by the Service Station people there. Its general appearance is much different than that of, *Coryphantha deserti* growing at the same place.

A specimen sent by McCabe Cactus Garden of San Diego labeled "Coryphantha arizonica" from Walapai Mountains, near Kingman, Arizona, seems to be *Coryphantha deserti*. Their specimen labeled "unknown Coryphantha" from Pipe Springs, Arizona, is identical with the specimen secured from Goffs, California. They have also sent a photograph of a plant from Pipe Springs. These are the plants collected several years ago and identified wrongly as *Utahia sileri*. They grow to be very large when single, but spread in large masses when multiple.

These plants may be readily distinguished from *Coryphantha deserti,* which species they most closely resemble, by the much fewer (15 to 20) radial spines and the larger size of both radial and central spines; longer tubercles of *Coryphantha arizonica;* by the lack of central spines (similar to *Coryphantha aggregata*) in young plants or young heads on multiple plants; by the depressed apex caused by tardy development of spines in the new areoles; and often by the subglobose forms of heads in contrast to the conical shape of *Coryphantha deserti.* Color of flowers is different, and the light pink petals of *Coryphantha arizonica* are ragged-appearing with the tips sometimes divided into several ragged points whereas the rose-colored petals of *Coryphantha deserti* are more regular.

Coryphantha arizonica ranges into California in the eastern limits of the California distribu-

McCabe Photo

Coryphantha arizonica. *This specimen is one flowering in cultivation. The McCabes say of it: "A coryphantha found near Pipe Springs, Arizona; different from any others and very scarce; flowers pink; plant is hard to raise in cultivation; it has extra long nipples; plant 6 to 8 inches high when full grown; clumps in old age." Note the hairy edge of the petals and the divided tips of some of them. This specimen has fewer radial spines than most plants of the species.*

tion of *Coryphantha deserti,* that is, in the eastern 40 or 50 miles of the State near the Nevada line, not south of the Colorado river. It is evidently very scarce, and must have a higher altitudinal range than *Coryphantha deserti.*

The following is the original description of the species by Engelmann, and Coulter's combination of it as a *Cactus.* Professor Ira Wiggins, Stanford University, has kindly copied this material from the original publications, found in the library of the Dudley Herbarium.

"Coryphantha arizonica (Engelm.) Britton & Rose, Cactaceae 4: 45. 1923."

Described first by Engelmann as a Mammillaria, as follows:

"**4. M. Arizonica,** Engelm. n. sp. Globose or ovate; tubercles long-cylindrical, ascending, deeply grooved, bearing numerous straight rigid spines; the 15 to 20 exterior spines whitish; the 3 to 6 interior ones stouter, deep brown above; flowers large, rose-colored; sepals 30 to 40, linear subulate, fimbriate; petals 40 to 50, lance-linear, awned; stigmas 8 to 10, white; berry oval, green, with obovate compressed pitted light brown seeds.

"On sandy and rocky soil in Northern Arizona, from the Colorado eastward (*Coues, Palmer, F. Bischoff*), probably in Southeastern California. Larger in all its parts than the foregoing species; 3 or 4 inches thick; tubercles an inch long; spines 5 to 15 lines long; flowers 2 to 2½ inches wide, very showy."

(The "foregoing species" is listed as "M. phellosperma, Engelm.") The above is copied from Botany of California, 1: 244. 1876.

Coulter made the combination "Cactus radiosus arizonicus (Engelm.)" in the Contributions of the U. S. National Herbarium Volume 3: 121. 1984. and the only information given there is the following:

"**60. Cactus radiosus arizonicus (Engelm.)**

Mammillaria arizonica Engelm. Bot. Calif. 1: 244. (1876).

"A robust globose or ovate simple form (7.5 to 10 cm. in diameter), with long (12 to 25 mm.) deeply-grooved tubercles, 15 to 20 long (10 to 30 mm.) rigid whitish radial spines, and 3 to 6 centrals deep brown above.—Type, the specimens of Coues, Palmer, Bischoff, and Johnson, all in Herb. Mo. Bot. Gard.

"Sandy and rocky soil from Southern Utah through northern and western Arizona to southern California.

"Specimens examined: ARIZONA (*Coues* of 1865; *Coues & Palmer* of 1865 and 1872; *Palmer* of 1869; *Bischoff* of 1871; *Miller* of 1881; *Rusby* 617 of 1883; *Pringle* of 1884); UTAH (*Johnson* of 1871, 1872, 1874; *Parry* of 1875, 1877); CALIFORNIA (*Parrish* of 1880); also specimens cultivated in Mo. Bot. Gard. in 1881; and in Meehan's Gard. in 1882."

CORYPHANTHA ALVERSONII

Coryphantha alversonii has been considered as a synonym by Britton & Rose in "The Cactaceae" where it is referred to *Coryphantha deserti.* My field trips and studies of the Californian Coryphanthas show very definitely that its specific rank is valid, so the combination made by Orcutt (*Coryphantha alversonii*) should stand as its designation.

CORYPHANTHA ALVERSONII (Coulter) Orcutt, Cactography 3. 1926.

Cactus radiosus alversonii Coulter, Contr. U. S. Nat. Herb. 3: 122. 1894.

Mammillaria alversonii Zeissold, Monatsschr. Kakteenk. 5: 70. 1895.

Mammillaria radiosa alversonii Schumann, Gesamtb. Kakt. 481. 1898.

Coryphantha alversonii differs from *Coryphantha deserti* in its distribution, size, number of central and radial spines, number of stems, etc., etc. These differences are constant in seedlings, grafted plants, and in plants kept in cultivation together.

It was first described in 1894 as a variety of *Cactus radiosus* (*Mammillaria radiosa*), along with the varieties *arizonicus, chloranthus, deserti,* etc. Later two German revisers changed its name to *Mammillaria alversonii* (Zeissold, 1895) and *Mammillaria radiosa alversonii* (Schumann, 1898) where it stayed until classed as a synonym by Britton and Rose in "The Cactaceae." In 1926 Orcutt published it in one of his works as *Coryphantha alversonii* and this name is used here as proper for the species. I have not been able to secure a copy of Mr. Orcutt's work for reference.

The original description by Coulter is given here through the courtesy of Professor Ira Wiggins, Curator of the Dudley Herbarium at Stanford University, who copied it from the original work cited above:

"63. Cactus radiosus alversonii, var. nov.

"Differs from var. *deserti* in its more robust and branching habit (becoming 12.5 cm. tall and 10 cm. in diameter), shorter and thicker tubercles, more numerous (12 to 14) centrals, stouter and longer (12 to 22 mm.) spines, all of which are black-tipped (the centrals black half way down, shading into red), and pink flowers. Type, Alverson's specimens in Herb. Mo. Bot. Gard. and in Herb. Coulter.

"In the desert region of extreme southeastern California.

"Specimens examined: SOUTHERN CALIFORNIA (*A. H. Alverson* of 1892): also growing in Mo. Bot. Gard. 1893.

"The covering of stout bushy interlocking spines is like that of var. *deserti,* but the black and reddish coloration gives a decidedly different appearance. On account of this appearance of a reddish-black brush the plant has been popularly called "fox-tail cactus." The decidedly pink flowers were sent by Mr. S. B. Parish from specimens growing in cultivation in San Diego, and are not from the original collection of Mr. Alverson."

The following is my description made from plants growing westward and eastward of 29

Palms, California:

Central spines 14, subulate, upper half of each spine shortly shading to black, lower half white. Radial spines 35 and fewer, longer than the centrals, larger in upper half of areole than in lower, generally black-tipped; slender but not bristle-like.

Tubercles are arranged in rows of 13x21; grooved on upper side, comparatively short and thick, conical.

Flowers come from lower end of groove in matured new tubercles, quite large—1¼ inches long, opening about ½ as wide. Outer petals have cilia along both edges. All petals are acutely pointed, lavender-pink with a rose mid-vein. Style and stigma lobes white, 6 lobes.

Plants are single or often branching near the base or middle into clusters of three to as many as a dozen heads. Plant body is short cylindric, as large as 3 inches thick by 8 inches high, seemingly thicker because of the heavy spine covering.

The distribution of this species is in the middle of Southern California's deserts from the Devil's Garden in the Morongo Valley to isolated groups a little east of Baker. It occurs most abundantly in the mountain canyons north of Indio through into San Bernardino County.

Taken from its home into coastal gardens the plants soon lose the vivid coloring and die. Thousands have been so treated and today only a few may be found alive. Plants graft readily onto *Cereus* and *Trichocereus*, but seeds are so easy to find that no garden should be without this specimen in seedling form.

As in the other Coryphanthas, the fruit is green when mature and smooth skinned. They ripen soon after flowering.

Coryphantha alversonii is found only in its California distribution. *Coryphantha deserti* extends into Nevada and probably Utah. The California species is one of the largest and most beautiful of the Coryphanthas, a native of which natives may well be proud.
